

interaction with *Yersinia pestis* was investigated in 250-300 g outbred guinea pigs. The results demonstrated that the MPC system populations that vary in location are heterogeneous in their phagocytic activity with respect to *Y. pestis*. In addition, the MPC system populations differ from one another in their lysosome content, with alveolar macrophages being the most enriched with lysosomes. The data also demonstrate that macrophages from different tissues are heterogeneous in the intensity of change in oxygen-dependent metabolic processes upon contact with the plague pathogen. Alveolar macrophages are less active than peritoneal macrophages in this respect. Moreover, the digesting activity of alveolar macrophages is much lower in comparison to macrophages from other tissues. These findings demonstrate that MPC system populations that vary in location have their own characteristic aspects and that data obtained on one population should not be extrapolated to others. Finally, the results also indicate that reproduction of *Y. pestis* in the macrophages elicits greater virulence, antiphagocytic properties, and cytopathic activity, which result in the death of a significant number of these cells. Figures 1; tables 2; references 14: 3 Russian, 11 Western.

Prevention and Treatment of Fatal *Staphylococcus* Infection in Guinea Pigs With Synthetic Regulatory Opioid Peptide Dalargin

917C0286E Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 11, Nov 90 (manuscript received 25 Feb 90) pp 112-113

[Article by S. B. Pashutin and T. D. Samykina, Surgery Institute imeni A. V. Vishnevskiy, USSR Academy of Medical Sciences, Moscow]

UDC 615.919:579.861.2].015.4.076.9

[Abstract] This paper presents experimental substantiation for the development of new methods of preventing and limiting the infection process with the use of the synthetic leu-enkephalin analog dalargin in the comprehensive treatment of purulent surgical infections. *Staphylococcus aureus* strain 6567 was administered to 142 outbred male guinea pigs (330-350 g) to both rear paws (100 µl each, intramuscularly) to induce septic shock, or to the right rear paw (100 µl, intramuscularly) to induce generalized infection. Dalargin was administered (100 µg/kg, intramuscularly) 1 and 3 h after infection, but it only extended life by 6 h in the septic shock experimental group, to 24 h. Dalargin was administered to the generalized infection group 6 h after infection, and increased the survival rate from 0 percent for the control group to 30 percent for the experimental group. Repeat dalargin injections (100 µg/kg) 1, 2, and 3 days later enhanced resistance to *Staphylococcus aureus* infection and increased the survival rate to 60 percent. These data demonstrate that dalargin enhances resistance to bacterial infection and the effectiveness of pathogenetic therapy.

Simulation and Situation in D

917C01714 Kiev UKRAINSKOY B—GEOLOGICHESKOY BIOLOGICHESKOY (manuscript received)

[Article by V. I. Institute, Ukraine]

UDC 577.34.5

[Abstract] This describing the Dnepr river w cesses in the wa bottom. This n spreading in a radionuclide c Figures 2, refer

Effect of Cert of Children

917C01964 M Russian No 11 pp 12-13

[Article by M. I. Kenesariyev, ology and Lab Alma-Ata]

UDC 614.71

[Abstract] An of a study on tion and the b studied two de with chemical the atmosphere and one that l atmospheric p studied were s socioeconomic researchers ex biochemical n data involving period. They l involved ilne trous diseases chits account problems enc form of infect children living higher than th - 3. The level acid in the uri the children l and 70 perc

[Abs
obtai
who
direc
syste
disse
betw
is, c
syndr
ory f
perce
n ne
obser
ole t
able

[Abstract] E
altitude (32
(18 - 26 ye
were condu
In the case

opiopeptides. The endorphins and enkephalins evidently suppress the function of the skin afferents, as expressed in the form of anesthesia and analgesia. The results also indicated that TES significantly and reversibly alters the receptor function of the skin afferents. These findings suggest that endogenous opiopeptides may help regulate and form the afferent current in both the central nervous system and in the sensory endings. Figures 1; references 14: 3 Russian, 11 Western.

Effect of Melatonin and Epiphysis Removal on Monooxygenase System Status in Rat Liver

917C0162B Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian Vol 110 No 11, Nov 90 (manuscript received
3 Apr 89) pp 478-480

[Article by A. V. Popov, V. V. Zarubin, E. B. Arushanyan, and T. M. Luneva, Chair of Pharmacology, Stavropolskiy Medical Institute and Microbe Biochemistry Laboratory, Antiplague Scientific Research Institute of the Caucasus and Transcaucasus]

UDC 612.351.11:577.152.143].014.46:615.357.
814.53+615.357.814.53.015.4:[612.351.11:577.152.143

[Abstract] The status of microsomal oxidation processes in the liver in response to melatonin administration (1 mg/kg per day, 24 days) before and after epiphysis removal was assessed in 44 outbred male rats (140-200 g). Investigation of monooxygenase system enzyme activity in hepatic microsomes demonstrated that chronic administration of melatonin is accompanied by a 1.4- to 1.6-fold rise in the amount of microsomal cytochromes P-450 and b_5 . Also revealed were a rise in NADH-dependent flavoprotein activity. In addition, melatonin depressed NADPH-dependent N-demethylase and n-hydroxylase activity. The biochemical changes following epiphysis removal were in many ways opposite to the effects of melatonin administration, thus indicating their specific character. There were also significant decreases in P-450 and b_5 cytochrome contents in rats that had their epiphysis removed. These opposite changes were found for almost all indices and were enhanced both by melatonin administration and epiphysis removal, thus suggesting that there are other biologically active factors in the epiphysis that modify the hepatic microsomal oxidation system. These data indicate that the adaptogenic properties of melatonin probably occur by means of auxiliary mechanisms of activating the hepatic monooxygenase system. The findings suggest that the biochemical effects of exogenous melatonin are governed by the secretion of the endogenous hormone or other epiphyseal factors through the melatonin receptors. Figures 2; tables 1; references 13: 7 Russian, 6 Western.

Effect of Rapid Eye Movement Sleep Deprivation in Rotational and Stereotypical Behavior Elicited by Selective Dopamine Receptor Agonists

917C0162C Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian Vol 110 No 11, Nov 90 (manuscript received
8 Jun 89) pp 495-497

[Article by N. A. Bondarenko, V. Klimek, J. Maj, and A. V. Valdman, Pharmacology Scientific Research Institute, USSR Academy of Medical Sciences, Moscow; Pharmacology Institute, Academy of Sciences, Krakow, Poland]

UDC 615.214.32.015.4.076.7

[Abstract] The effect of D_1 and D_2 agonists of dopamine (DA) receptors Ly-171555 and SKF-38393 on the induction of rotational (qualitative and quantitative behavioral index of DA receptor function) and stereotypical behavior was investigated on 150-180 g outbred male rats with a unilateral striatal kainic acid lesion prior to and following prolonged rapid eye movement (REM) sleep deprivation. It was shown that Ly-171555 stimulation of D_2 receptors elicited ipsilateral rotation in a dose-dependent manner, but had no effect on oral forms of stereotypy. On the other hand, SKF-38393 elicited intensive oral stereotypical reactions, but no rotation. The results demonstrated that increased doses of apomorphine and the mixed DA receptor agonists decreased ipsilateral rotation by 85.5 percent with a concomitant rise in oral stereotypy. These data suggest that agonist amplification of ipsilateral rotation following REM sleep deprivation is mediated by a nonidentical shift in DA receptor subtype sensitivity in both the nigrostriatal and mesolimbic systems. Furthermore, long-term intensive reaction of endogenous DA with both DA receptor subtypes in REM sleep deprivation results in a selective increase in D_1 subtype sensitivity. In other studies, it was shown that REM sleep deprivation accompanied by stress enhances tyrosine hydroxylase activity, which is coupled with an increase in tyrosine hydroxylase affinity for tyrosine and α -methyl paratyrosine (MPT). It was also demonstrated that a single administration of α -MPT to animals subjected to REM sleep deprivation completely precluded the effect of Ly-171555, with subsequent SKF-38393 administration restoring rotation behavior. The results indicated that inadequate tonic activation of D_1 receptors to endogenous DA prevents manifestation of the effect of selective D_2 receptor agonists of Ly-171555, thus indicating that the postsynaptic D_2 receptors are not supersensitive, nor are they functionally associated with D_1 receptors. These data show that selective agonist induction of DA receptors of rotational and stereotypical behavior and its intensity depend on the degree and duration with which the complementary receptor subtype stimulates endogenous DA. The findings suggest that long-term intensive tonic activation of DA receptors elicited by behavioral REM

JPRS-UIS-91-012
20 MAY 1991

UDC 612.71

[Abstract] The effect of the mechanical stimulation of the chinchilla rat the experimental radial incisor peripheral on the post-operative animals were the eyes removed of the subjects, each of cylindrical diameter of 1.0 mm in diameter zone in experimental. The tears in area that can tears in the area along a caution that human eye thinner and assert that if correct that merable to if process 1.0 W

UDC 615.356.577.164.15/017.615.214.31/076.9

[Abstract] Nicotinamide, which has tranquilizing and stress-protecting properties, and its structural analogs nicomorpholin [sic] and azethylnicotinate [sic] were investigated as substances with nootropic activity on male albino outbred mice (22-26 g). All three of these compounds were administered intraperitoneally 30-40 min prior to investigation. Experiments on the antihypoxic effect of nicotinamide revealed a distinct protective effect in conditions of hypobaric hypoxia, increasing survival 2.5-fold. It also increased viability in normobaric hypoxia and "rigid" hemic hypoxia. However, nicomorpholin and azethylnicotinate were shown to be even more effective than nicotinamide in antihypoxic activity. Furthermore, these compounds exhibited anti-amnesic properties in conditioned passive avoidance reflexes, with the analogs again shown to be more effective. Nicotinamide and its analogs were compared with piracetam, pyritinol, and meclofenoxate, and a certain structural-electron similarity was found between piracetam and nicotinamide. This similarity was in the presence and arrangement of p- and π -electron systems and the distance between the atoms entering the polar centers of the molecules. Figures 1; tables 2; references 7: 5 Russian, 2 Western.

Involvement of Dihydropyridine-Sensitive Ca-Channels in Psychotropic Effect of Nootropes

917C0180H Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
16 Feb 90) pp 386-389

[Article by Yu. G. Bobkov, P. V. Polev, A. I. Machula, Ye. A. Valdman, N. M. Soldatov, and S. M. Dudkin, Scientific Production Center for Biomedical Technology, USSR Ministry of Health, Moscow]

UDC 615.214.22.015.4.612.821.2.06:612.822.1.015.31:546.41

[Abstract] The effects of nootropes and various L-channel blockers in cerebral channels on simple memory tests were investigated on outbred male mice (16-20 g) and Wistar rats (200-220 g) in conditioned passive avoidance reactions. The preparations were administered intraperitoneally in 10 mg/kg doses 1 h prior to initiation of learning, with nifedipine, verapamil, and diltiazem exhibiting the maximum and most similar effects as evidenced by the significant decrease in the duration of the avoidance reaction latent period and the number of mice that "learned" within 24 h. It was hypothesized that deterioration in the reproduction of learning that occurred in response to administration of the Ca-channel blockers was associated with their direct inactivating effect on dihydropyridine-sensitive Ca-channels. Data from experiments on the effects of piracetam and oxiracetam on learning indicate that these agents effectively stimulate learning and memory in animals and express marked antagonism with respect to

the inhibiting effect of diltiazem. In addition, the results show that antagonism in the effect of the blockers and nootropes on learning and reproduction may be due to their effect on the biosynthesis of L-type Ca-channels. Furthermore, it is possible that the plasticity of these channels in the cerebral cortex plasma membranes is one of the important properties of the Ca^{2+} regulatory system that governs memory formation. Finally, the results also have fundamental practical significance, since Ca-channel blockers are widely used for treating cardiovascular diseases. Figures 1; tables 3; references 14: 2 Russian, 12 Western.

Emoxypine Pharmacokinetics in Norm and in Experimental Pathology Models

917C0180I Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
15 Dec 89) pp 389-390

[Article by Ye. V. Mishina, N. G. Filippenko, V. V. Pichugin, V. P. Zherdev, A. V. Lebedev, N. V. Kameneva, and A. A. Shvedova, Department of Clinical Pharmacology, Kursk Medical Institute, Scientific Research Institute of Pharmacology, USSR Academy of Medical Sciences; Chemical Physics Institute, Moscow]

UDC 615.272.014.4.25].033.07

[Abstract] The experimental pharmacokinetics of emoxypine, a biogenic antioxidant currently used as an angio- and retinoprotector that also has a protective effect in myocardial infarction by limiting the size of the infarction, were investigated following intravenous administration (10 mg/kg) to 1.8-3.2 kg rabbits in which experimental pathologies were simulated. High performance liquid chromatography was employed to measure emoxypine concentrations before and after infusion. The results demonstrated that emoxypine is rapidly excreted and is removed quickly from the blood. It penetrates into the organs and tissues where it is deposited and metabolized. Moreover, the post-infarction status significantly alters emoxypine pharmacokinetics, and changes were especially marked in the stages of emoxypine distribution and excretion. Finally, the simulated pathological conditions radically affect emoxypine kinetics. Figures 1; tables 1; references 6: Russian.

Effect of Liposomal Form of Triombrast on Lipid Composition in Blood and Organs in Experimental Animals

917C0180J Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
18 Jul 89) pp 393-395

[Article by O. A. Rozenberg, N. L. Shimanovskiy, Ye. N. Mineyeva, N. Ya. Mikhaylova, N. V. Makaryeva, M. A. Dolgopyatova, K. P. Khanson, and P. V. Sergeyev, Central X-Ray Radiology Scientific Research Institute,

USSR Ministry of Health, Leningrad, Second Moscow Medical Institute (men N. I. Pirogov)

UDC 616.153.915-092.9-073.755.4

[Abstract] The effect of the liposomal form of triombrast (LFT) on the lipid composition of the blood and organs was investigated in 50 outbred male rats (120-150 g) administered 5 mg/kg of this preparation intravenously. Analysis of the lipid composition in the plasma, erythrocytes, liver, spleen, and kidneys revealed changes within 2 h after the LFT was injected, except in the kidneys. In addition, the phosphatidylcholine, phospholipid, and cholesterol levels were elevated two- to three-fold, while triglyceride and fatty acid concentrations increased by three to five times. In contrast, the administration of free triombrast to control rats had no effect on the lipid composition, while the triglyceride level in the plasma increased by 1.9-fold. Normalization of the lipid composition in the blood and organs was noted 12 h after administering the LFT, with no differences noted between the experimental and control groups 24 h after administering the preparation. The elevated lipid content observed in the erythrocytes is probably due to inspecific sorption of the liposomes on the erythrocytes. Although the LFT elevates the lipid content in the blood, liver, and spleen, these changes pass quickly and differ little from the ordinary fluctuations in lipid composition that are involved with digestion and will not impede the clinical use of liposomal forms of X-ray contrasting agents. Tables 1; references 9; 4 Russian, 5 Western.

Effect of Triophene on Thrombocyte Aggregation

917C0180K Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
28 Jun 88) pp 395-396

[Article by A. N. Tulupov, L. V. Filev, A. N. Belskikh, Yu. V. Medvedev, and V. G. Popov, Military Medical Academy imeni S. M. Kirov, Leningrad]

UDC 616.155.25-008.1-085.279.53

[Abstract] The antiaggregant potential of triophene, a known biostimulant, was investigated *in vitro* using thrombocytes from 12 healthy donors and 20 patients with acute purulent-deteriorating illnesses of the lungs and pleura in which hyperaggregation of the platelets was observed. The data showed that aggregation of the platelets was slow and poorly reversible, but treating the thrombocytes with persantin slightly improved the aggregation rate and degree and rate of deaggregation. However, incubating the thrombocytes with triophene substantially improved indices of adenosine-diphosphate-disodium salt-induced aggregation. Results demonstrating the favorable effects of triophene treatment of thrombocytes *in vitro* on the aggregation properties of these cells reveal new possibilities for drug

correction in the thrombocytic link of hemostasis. Tables 1; references 4; 3 Russian, 1 Western.

Effect of Dalargin on Mitotic Processes in Stomach Epithelium During Stress

917C0180L Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
12 Jan 90) pp 399-401

[Article by S. S. Timoshin, S. I. Shvets, N. B. Murzina, and G. P. Berezina, Central Scientific Research Laboratory, Khabarovsk Medical Institute]

UDC 616.33-018.73-018.15-02:613.863-
02:615.31:[547.95:547.943

[Abstract] The effect of dalargin, a leu-enkephalin analog, on the accumulation of malonic dialdehyde and the noradrenalin content in stomach tissue was investigated in 150-180 g male rats administered 10 µg/kg of the preparation. The proliferative processes in the pylorus were assessed by the amount of ³H-thymidine labeled nuclei and the intensity of the label, which characterizes the rate of DNA synthesis. The results demonstrated that 1 h following the end of immobilization stress, the number of ³H-thymidine labeled nuclei in the pyloric epithelium decreased four-fold and the label intensity decreased 1.7-fold in the control, while these figures were two-fold and zero, respectively, for animals pretreated with dalargin. Thus, these data indicate that dalargin prevents stress-induced disturbances in DNA synthesis and mitosis and attenuates the decrease in the proliferative pool. In addition, the findings also showed that dalargin pretreatment of the rats prevented the stress-induced 1.5-fold elevation of malonic dialdehyde that otherwise occurred in control animals. Moreover, dalargin's ability to decrease the noradrenalin tissue concentration contributes to the maintenance of homeostasis during stress. In conclusion, these data indicate that dalargin can be used to not only treat exacerbation of stomach and duodenal ulcers, but it can also be used to prevent and treat acute ulcers and erosions. Tables 1; references 15; 14 Russian, 1 Western.

Investigation of Effect of Immunostimulant T-Activin on Thymocyte Plasma Membrane Electrical Properties Using Fluorescent Probes

917C0180M Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
20 Dec 89) pp 402-404

[Article by V. A. Petrov, A. V. Sinegubov, Ye. V. Sokolova, N. V. Glukhova, V. V. Smeyanov, and L. V. Kovalchuk, Department of Biophysics and Immunology, Biomedical Faculty, Second Moscow Medical Institute imeni N. I. Pirogov]

UDC 615.362.438.017.615.275.4/.015.4/
612.438.014.576.314/.076.9

[Abstract] The effect of T-activin on the electrical properties of a membrane suspension of thymocytes obtained from two-month-old CBA x C57Bl mice was investigated using a method of membrane fluorescent probes. The thymic lymphocytes were placed in Henck's solution and diluted with neuraminidase to a final concentration of 50 units/ml and incubated at 37°C for 30 min. The results showed that T-activin evidently did not cause any changes in the structure of the polar layer of the thymocyte membrane at the site of the various probes and did not affect the water status in it. It was shown that the fluorescent intensity of the positively charged probe 2-(n-dimethylaminostyryl)-4-methylpyridinium decreased by approximately 20 percent, while the fluorescent intensity of the negative probe 1-anilinonaphtalene-8-sulfonate [sic] (ANS) increased by 2.3-fold. These phenomena are explained by an increase in the positive charge of the thymocyte membrane layer, a decrease in the negative charge, and depolarization of the transmembrane potential on the plasma membrane. In conclusion, T-activin apparently elicits depolarization and a decrease in the transmembrane potential on the thymocyte plasma membrane. As a result, ANS enters the cell and binds with intracellular membrane structures, causing an increase in its fluorescence. Figures 2; references 15; 10 Russian, 5 Western.

In Vitro Effect of Arginine Vasopressin on Rat Thyroid Gland

917C0180N Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
28 Dec 89) pp 423-425

[Article by G. V. Dityateva, I. A. Krasnovskaya, and V. I. Skopicheva, Neuroendocrinology Laboratory, Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences; Cytology Institute, USSR Academy of Sciences, Leningrad]

UDC 615.357.577.175.343/.015.4:612.44/.076.9

[Abstract] The effects of neurohormones on the thyroid gland were investigated *in vitro* on thyroid glands obtained from young male Wistar rats to obtain a definite answer as to whether these hormones have a direct effect on thyrocytes. The results demonstrated that after incubating the thyroid glands for 30 min with thyrotropic hormone (TTH), there is an increase in the height of the thyroid epithelium and a slight increase in the amount of ³H-leucine label above the thyrocytes, with further incubation with TTH leading to enhanced elimination of the thyroid hormones. In another series of experiments, it was shown that 0.5 h after vasopressin (in a concentration of 5×10^{-11} M/l, which is typical of the level in the blood of stressed animals) starts acting on the thyrocytes, there is significant accumulation of the radioautograph above the thyrocytes, thus indicating the

activation of thyroid hormone formation. The abrupt decrease in the amount of label that occurs when the gland is incubated up to 2 h in a culture containing vasopressin but lacking ³H-leucine demonstrates the intensive processes of elimination of the thyroid hormones from the gland pieces being incubated. Conclusions drawn from these observations make it possible to suggest that thyroglobulin forms and accumulates in the follicles when the thyroid gland is incubated in a hormone-deficient culture. In addition, it was shown that TTH accelerates colloid resorption and elimination of the thyroid hormones, as reflected by the lack of labeled thyroglobulin accumulation in the colloid and by the increase in the height of the thyrocytes. Moreover, the effect of vasopressin depends on its concentration: low doses of vasopressin stimulate the peripheral endocrine glands while high doses inhibit them. In conclusion, these results demonstrate the direct paraadenohypophyseal effect of vasopressin on the rat thyroid hormone. Figures 3; references 16; 4 Russian, 12 Western.

Dalargin Control of Ocular Lymphodrainage Tracts

917C0180O Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
2 Dec 89) pp 436-438

[Article by Ye. G. Rapis, V. P. Tumanov, Yu. M. Levin, and N. Kh. Kurbanov, Turkmen Scientific Research Institute of Ocular Diseases, Ashkhabad]

UDC 617.7-007.681-092.9-085.31:[547.95:547.943]-
036.8-07

[Abstract] Experimental trials on the effect of dalargin on ocular drainage tracts were conducted in control rabbits and in rabbits with experimental hypertension and simulation of secondary glaucoma. There were three series of experiments on 82 eyes in chinchilla and giant albino rabbits: 1. morphologic investigation of the drainage tracts in the ocular anterior chamber and vitreous body following subconjunctival or electrophoretic administration of dalargin (the same amount and concentration of dalargin, 0.1 percent, 0.2-0.3 ml, was used in all cases); 2. determination of dalargin's effect on ophthalmotonus in normal intraocular pressure and in experimental ophthalmohypertension; and 3. simulation of secondary glaucoma using sulfuric acid and dalargin's effect in this situation. The results demonstrated that intraocular pressure increased from the baseline level of 20-22 mm Hg to 30-41 mm Hg in nine out of ten cases following the burn to simulate secondary glaucoma. After dalargin administration, the intraocular pressure dropped within 30 min to 2 h from 2 to 10 mm Hg in nine out of ten cases. Figure: 3; references 5; 3 Russian, 2 Western.

Radioautographic and Immunohistochemical Analysis of ^3H -Melatonin Distribution in Endocrine and Non-Endocrine Organs

917C0180P Moscow BYULLETEN
EKSPERIMENTALNOY BIOLOGII I MEDITSINY
in Russian No 10, Oct 90 (manuscript received
29 Nov 89) pp 438-440

[Article by V. V. Yuzhakov, I. M. Kvetnoy, and G. A. Petrova, Scientific Research Institute of Medical Radiology, Obninsk]

UDC 616.43-018.1.008.94:612.826.33.018

[Abstract] This report presents data on the radioautographic and immunohistochemical investigation of the distribution of ^3H -melatonin in some endocrine and non-endocrine organs soon after its administration (185 kBq/g, intraperitoneally) to male BDF₁ rats. The animals were sacrificed 5 min, 1 h, and 3 h after injection to determine ^3H -melatonin contents in the adrenal glands, duodenum, pancreas, and spleen. The results demonstrated that ^3H -melatonin was found in all the organs 5 min after injection, while at 1 h, the greatest concentrations were found in the duodenum, adrenal glands, and pancreas. The findings suggest that the disparity in the nature of the distribution of the radioactive label and the histotopographic location of the melatonin-containing cells in all of the organs analyzed is evidently due to the different recording capacities of the methods employed. A comparison of the radioautographic and immunohistochemical data indicates that the products of melatonin metabolism are quickly carried throughout the body and most heavily concentrated in cells with a high level of biosynthetic processes in the adrenal medullary cells, pancreatic acinar cells, and duodenal epitheliocytes in the villi. These results thus demonstrate that exogenous melatonin can accumulate in some endocrine cells as well as non-endocrine cells in endo- and non-endocrine organs. References 18: 5 Russian, 13 Western.

β -Endorphin Influence on Conditioned Response in Cats

917C0191A Moscow FIZIOLOGICHESKIY
ZHURNAL SSSR IMENI I.M. SECHENOVA
in Russian Vol 76 No 8, Aug 90 (manuscript received
21 Dec 89) pp 992-1000

[Article by A. I. Karamyan (dec.), Yu. A. Pankov, A. L. Protsenko, T. N. Sollertinskaya and I. L. Kofman, Laboratory of Comparative Physiology and Pathology of the Central Nervous System, Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad; Laboratory of Molecular Biology, Institute of Experimental Endocrinology and Hormone Chemistry, USSR Academy of Medical Sciences, Moscow]

UDC 612.821+577.15/17

[Abstract] Further definition of β -endorphin effects on higher nervous functions was undertaken in 3.5-5 kg cats, employing conditioned food responses. In conventional tests subcutaneous administration of β -endorphin in doses of 10-16 $\mu\text{g/kg}$ facilitated both positive and negative conditioned responses. The latter indicated that β -endorphin acted via a neurochemical mechanism in effecting adaptation to variable environmental conditions. However, in a more complex setting involving a choice between a preferred and secondary feed box and two positive stimuli, the effects of β -endorphin were predicated on the level of original conditioning and individual typology. Accordingly, the effects of β -endorphin on behavioral strategy were especially significant in animals with low initial selection accuracy because of an undue preference for the feed box for which they were originally conditioned. In the latter case perseverance of feed box preference was interpreted to reflect neurotic-type behavior. Figures 4; tables 1; references 23: 16 Russian, 7 Western.

Comparative Assessment of Quinolinic Acid and L-Kynurenine Effects on Voltage-Gated Ion Channels of Mollusk Neuronal Membranes

917C0191B Moscow FIZIOLOGICHESKIY
ZHURNAL SSSR IMENI I.M. SECHENOVA
in Russian Vol 76 No 8, Aug 90 (manuscript received
20 Nov 89) pp 1017-1022

[Article by I. Yu. Artemyev, Laboratory of Neuron Physiology, Chair of Physiology, State Pedagogical Institute imeni A. I. Gertsen, Leningrad]

UDC 612.822.3:612.014.3

[Abstract] Neurons of the visceral ganglion of the mollusk *Lymnaea stagnalis* were used for a comparative assessment of the effects of tryptophan metabolites quinolinic acid and L-kynurenine on K⁺ channels. Oscillographic studies on the membrane potentials of the isolated neurons showed that quinolinic acid in concentrations of 7×10^{-5} to 10^{-3} M diminished the amplitude of the K⁺ current, whereas L-kynurenine at concentrations of 10^{-5} to 10^{-3} M in the perfusate in some case was inhibitory and in others enhanced K⁺ flow. The inhibitory effects of both metabolites were attributed to their interaction with N-methyl-D-aspartate receptors. The increase in amplitude in some neurons was attributed to L-kynurenine action on GABA_B receptors. Figures 2; tables 2; references 17: 9 Russian, 8 Western.

Pharmacologic Analysis of Adrenergic Modulation of Parasympathetic Inhibition of Myocardial Contractility

917C0191C Moscow FIZIOLOGICHESKIY
ZHURNAL SSSR IMENI I.M. SECHENOVA
in Russian Vol 76 No 8, Aug 90 (manuscript received
16 May 89) pp 1036-1042

[Article by L. V. Sorokin and N. M. Afanasyev, Laboratory of Pharmacology of Blood Substituents, All-Union

Scientific Research Institute of Technology of Blood Substituents and Hormonal Preparations, Moscow]

UDC 612.171+612.178

[Abstract] A series of agonists and antagonists of α - and β -adrenoreceptors were employed in an analysis of adrenergic modulation of myocardial contractility following vagal stimulation. The studies were performed on sinoatrial preparations of the frog *Rana temporaria* and male chinchilla rabbits, the latter involving EKG monitoring following intravenous injections of the pharmacologic agents. The results revealed that the beta-blocker obsidan did not affect parasympathetic inhibition, but prolonged epinephrine-induced inhibition of contractility. The combination of the α_2 -blocker yohimbine and epinephrine or isadrine almost completely abrogated the effect of vagal stimulation. Finally, Clonidine potentiated vagal effects on the myocardium. These observations indicate the presence of α_2 - and β -adrenoreceptors on the presynaptic endings of parasympathetic fibers through which adrenergic modulation of cardiac cholinergic mechanisms is exercised. Figures 5; references 7; 4 Russian, 3 Western.

Positive Chronotropic Influence of Salsolinol on Isolated Rat Heart

917C0191D Moscow FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOVA in Russian Vol 76 No 8, Aug 90 (manuscript received 27 Sep 89) pp 1043-1047

[Article by N. A. Sokolova, L. I. Chudakov, I. P. Ashmarin, T. M. Vinogradova, N. D. Volodin, G. P. Vlasov and I. N. Nikonova, Chair of Human and Animal Physiology, Biological Faculty, State University, No 23 Research Department, Institute of Physicotechnical Problems, Moscow; Laboratory of the Synthesis of Physiologically Active Polymers, Institute of Macromolecular Compounds, USSR Academy of Sciences, Leningrad]

UDC 612.172.2+612.014.46

[Abstract] Pharmacologic trials were conducted with salsolinol (6,7-dioxy-1-methyl-1,2,3,4-tetrahydroisoquinoline), a product of nonenzymatic condensation between dopamine and acetaldehyde in chronic alcoholism, to assess its cardiac effects. Studies on isolated heart preparations derived from outbred, 180-220 g, male rats revealed a dose-dependent positive chronotropic effect with $EC_{50} = 5.6 \times 10^{-6}$ M. The cardio-tropic effects of salsolinol were blocked by the beta-blocker propranolol (10^{-5} g/L) and potentiated by naloxone (3.1×10^{-5} M), an opioid antagonist. In addition, naloxone mitigated salsolinol-induced arrhythmia. Accordingly, these findings indicate that salsolinol may be a significant factor in the cardiac status of alcoholics. Figures 2; references 14; 3 Russian, 11 Western.

Somatotype and Ventilatory Response to Hypercapnic Stimulation

917C0191E Moscow FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOVA in Russian Vol 76 No 8, Aug 90 (manuscript received 16 Oct 89) pp 1061-1067

[Article by P. M. Shmerling, S. G. Krivoshechekov, Laboratory of Shift Work Physiology, Institute of Physiology, Siberian Branch, USSR Academy of Medical Sciences, Novosibirsk]

UDC 612.2:612.23+612.273

[Abstract] Hypercapnic sensitivity (S) was assessed in the case of 30 men with a mean height of 174.6 cm and a body weight of 69.5 kg in relation to fat content (%F) and muscle mass (%M). The results of regression analyses demonstrated that S is directly related to the fat content and indirectly to the muscle mass: $S = (6.704 - 0.098) \times \%M$ and $S = (0.338 + 0.106) \times \%F$. Accordingly, these findings indicate that individuals with a better muscular development and relatively smaller fat deposits are better able to withstand hypercapnia. Figures 1, tables 2; references 20; 3 Russian, 17 Western.

Mechanisms of Simultaneous Enhancement of Heat and Cold Tolerance in Rats

917C0191F Moscow FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOVA in Russian Vol 76 No 8, Aug 90 (manuscript received 16 Jun 89) pp 1078-1083

[Article by Yu. I. Rossomakhin, Chair of Human and Animal Physiology, State University, Donetsk]

UDC 612.53+577.4

[Abstract] An analysis was conducted on the physiological aspects of two months of simultaneous heat and cold adaptation of outbred, 160-180 g, male rats, consisting of alternating days of 4 h at 38°C and 16 h at -7 to 2°C. Monitoring of cutaneous and rectal temperatures, heart rate, respiratory rate, body weight, and weight of salivary glands, thyroid, brown fat and heart demonstrated that in heat-preadapted rats (38°C, 4 h/day, 3 months) simultaneous heat and cold adaptation enhanced tolerance of both factors. The physiological mechanisms responsible for this phenomenon involved both more efficient thermogenesis and heat release (primarily via salivary evaporation). In addition, in simultaneously adapted animals thermogenesis involved adrenergic mechanisms to a greater degree than thyroid mechanisms, in distinction to rats adapted only to cold. Accordingly, in the dually adapted rats thermogenesis is based on a more flexible mechanism capable of a faster response to changes in environmental temperatures. Tables 4; references 13; 4 Russian, 9 Western.

Cytokines and Their Role in Infection Pathology and Therapy

917C0241A Moscow ANTIBIOTIKI I
KHIMIOTERAPIYA in Russian Vol 35 No 9, Sep 90
(manuscript received 12 Feb 90) pp 12-14

[Article by M. M. Vyadro, All-Union Antibiotics Scientific Research Institute, Moscow]

UDC 616.9-092-078.33

[Abstract] A general summary of cytokines and their role in infection pathology and therapy is presented, with the review focusing on tumor necrosis factor, interleukin-1, and interleukin-6, which have become particularly significant in the pathogenesis of the infection process because they mediate diseases and are protective factors of the body. Cytokines are a universal mediator of the cellular response to inflammation, infection, tumors, stress, and other stimuli. The metabolic effects of cytokines play a substantial role in the pathogenesis of endotoxic shock. Moreover, cytokines themselves play an important role in the pathogenesis of serious septic infections. In addition, cytokines help kill various pathogens and may be regarded as potential candidates for use in the comprehensive treatment of patients with neutropenia who are at high risk for developing infections. Furthermore, data on the involvement of cytokines in the pathogenesis of the infection process are necessary for the development of new pathogenetic directions in infection therapy. Finally, using the potential for cytokine-induced antibacterial reactions and prevention or attenuation of undesirable toxic effects will help in the formation of new fields in the comprehensive treatment of the infection process. References 15: 2 Russian, 13 Western

β -Lipotropin and β -Endorphin in Hypothalamic Syndrome

917C0258A Moscow PATOLOGICHESKAYA
FIZIOLOGIYA I EKSPERIMENTALNAYATERAPIYA
in Russian No 5, Sep-Oct 90 (manuscript received
7 Feb 90) pp 9-12

[Article by F. I. Dzhabarov, Scientific Research Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow]

UDC 616.831.41-008.6-07:616.831.4-008.939.6

[Abstract] Against the backdrop of their effect on the central mechanisms underlying the self-regulation of the main functions of the body, physiologically active endogenous peptides have been shown to take part in the formation of emotions, motivation, and memory, as well as in the restoration of the sphere of motivation-emotion disrupted by injury, surgical intervention, or the blockade of protein synthesis. A great many endogenous peptides are derivatives of the β -lipotropichormone of the hypophysis. Such peptides are found in various

structures of the CNS, particularly in parts of the hypothalamus, whose arcuate region is regarded primarily as a β -lipotropin-synthetizing or -concentrating area of the brain. β -Lipotropin and some of its derivatives affect feeding behavior and metabolic processes. Yet, the participation of those peptides in processes involving the disruption of hypothalamic function in experiment is virtually unstudied. The work reported here examined the possible role of β -lipotropin (β -LPT) and β -endorphin in the compensation of feeding motivation and the associated functions after experimental injury of the arcuate section of the hypothalamus in 90 outbred albino male rats. Intraventricular microinjection of β -LPT (group II) and β -endorphin (group III) after arcuate injury was found to be effective in terms of restoration of the disrupted functions. By day 15 of observation after injection of β -LPT, group II exhibited much greater feeding, drinking, and orientation-exploratory activity than did control. Comfort behavior and spontaneous sleep and drowsiness declined. In group III, the volume of food consumed not only returned to baseline, it exceeded baseline by 13.3 percent. Food-seeking activity increased by some 47 percent. Drinking activity, however, dropped by 9.5 percent, and water intake declined. Orientation-exploratory behavior increased, but comfort-seeking acts and spontaneous sleep and drowsiness fell off. The data indicate that injury to the arcuate region of the hypothalamus is accompanied by the formation of a specific syndrome that includes disruption of forms of behavior such as feeding and drinking. That region affects feeding motivation. The data also point to the possibility that the effects of β -LPT and β -endorphin on the manifestations of the hypothalamic syndrome are tied to the elimination of the deficiency of those endogenous compounds and to the restoration of the functional links of that structure to other sections of the brain. Figures 1; references 21: 15 Russian, 6 Western.

Age-Related Features of Contractility of the Heart and Its Adrenergic Regulation in Catecholamine Damage to the Myocardium

917C0258B Moscow PATOLOGICHESKAYA
FIZIOLOGIYA I EKSPERIMENTALNAYA
TERAPIYA in Russian No 5, Sep-Oct 90 (manuscript
received 18 Oct 88) pp 17-19

[Article by L. M. Lobanok, A. Ye. Kiriyenkov, and O. N. Khotyanova, Institute of Radiobiology, BSSR Academy of Sciences, Minsk]

UDC 616.127-02:[615.357:577.175.52]-
07:616.12-008.4-053.8/9-092.9

[Abstract] Catecholamines play an important role in the regulation of vital processes of the body, and they do not cause pathologic changes in cell structure and function, because of the modulatory, self-limiting component of the adrenergic effect. But when catecholamine levels rise to excessive levels for lengthy periods of time, as they do,

for example, during stress, the modulatory component is not effective enough, and the adrenergic reaction is transformed from an adaptational-compensatory effect to a pathologic effect. So-called catecholamine damage to the myocardium and to other tissue results, largely because of the relative myocardial hypoxia, disruptions of microcirculation, changes in membrane permeability and adrenergic regulation, and the effects of free radicals. Since the biomechanics of the myocardium and its neurohumoral regulation change substantially with age, one can assume that the damaging effect of catecholamines at various stages of ontogenesis has features that must be elucidated if mechanisms of pathogenesis are to be understood and prevented. The researchers investigated the contractile function of the heart and adrenergic mechanisms of its regulation in the presence of catecholamine damage to the myocardium in 8-month-old and 26-month-old rats that had been injected with adrenaline (1 mg/kg i.m.) two days before the experiment. The functional response of the heart to stimulation of adrenergic receptors underwent substantial change. The chronotropic and inotropic responses of the catecholamine-damaged heart to such stimulation also changed considerably, and they were found to be a function of age. Studies of isolated cell preparations indicated that lengthy or massive stimulation of β -adrenergic structures leads to desensitization of those receptors, which may be a result from a reduction of their number or from changes in the adenylate cyclase system. In catecholamine damage to cardiomyocytes, the inotropic response of the heart to stimulation of both α - and β -adrenergic structures declines. Reduction of the inotropic response and the reaction of the coronary channel to stimulation of β -receptors in the 8-month-old rats was accompanied by increased sensitivity of myocardium cells and vessels to isoprenaline, whereas in the older rats, the shift of the curve to the left was inconsistent. The changes noted in the younger rats may be due to an increase in β -adrenergic receptors that have a high affinity for agonists or to enhanced transmembrane signal transmission, and they may serve to amplify the contractility of undamaged parts of the myocardium. The maintenance of the pumping function of the heart in the older rats with catecholamine damage to myocardial fibers and desensitization of some of the adrenergic receptors is effected via compensatory amplification of the contractile function of undamaged parts of the heart muscle, which may be due to glycolysis and the resistance of the myocardium to the effects of hypoxia. Figures 1; references 8: 4 Russian, 4 Western.

Effect of Acute Blood Loss on Hemostasis in Dogs Unadapted to High Altitudes

917C0258C Moscow *PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA* in Russian No 5, Sep-Oct 90 (manuscript received 12 Jan 89) pp 28-33

[Article by A. G. Rachkov, L. G. Rachkova, and S. B. Daniyarov, Department of Normal Physiology, Kirghiz Medical Institute, Frunze]

UDC 616-005.1-036.11-092:612.275.1]-092.9-07:616.151.5

[Abstract] In acute blood loss, hypercoagulation develops, accompanied by intravascular blood coagulation and activation of fibrinolysis, which is a defense mechanism of the body aimed at dissolving the fibrin in the blood channel. The absence of data on the effect of acute blood loss on hemostasis in an individual unadapted to high altitudes led the researchers to study the hemostasis system in 15 mongrel dogs (8-15 kg) subjected to acute blood loss after three days at 3,200 meters above sea level (on the Tuya-Ashu Plateau). The volume of blood loss constituted 2.5 percent of body weight. Dogs undergoing the same procedures at 760 meters above sea level (in Frunze) served as the control. In the Frunze dogs, the acute blood loss was attended by the expected hypercoagulation and activation of fibrinolysis, along with lower adhesive and aggregational activity of blood platelets. For the experimental dogs, the three-day stay itself resulted in hypercoagulation, with intravascular coagulation and amplified fibrinolysis. The blood-letting on the third day led to a decline in thrombocyte levels that was not as substantial as that observed at 760 meters. Although the number of blood platelets increased after five minutes, it returned to baseline values after 30 minutes. Thrombocyte adhesion rose after one minute of blood loss, but could not be determined after five minutes, because it coagulated when it was passed through fiberglass fabric, which indicates an excess of thrombin that is unneutralized by the anticoagulants. Platelet aggregation after one and five minutes was down sharply, because of thrombin in the blood channel, which causes the formation of aggregates that stick in the capillaries. After 30 minutes, an electrocoagulogram pointed to hypocoagulation. Results of the analysis indicate that intravascular blood coagulation in high altitudes leads to the accumulation of products that are degradative of fibrinogenesis and to the development of secondary hypocoagulation that has a protective function and prevents death in acute blood loss. The secondary hypocoagulation in the dogs prevented further growth of intensity of intravascular blood coagulation. References 7: Russian.

Neuroautonomic Mechanisms for Maintaining Blood Oxygen Balance in Individuals Exposed to Gaseous Hypoxic Mixture

917C0258D Moscow *PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA* in Russian No 5, Sep-Oct 90 (manuscript received 7 Feb 89) pp 33-37

[Article by Yu. Yu. Kiryachkov, V. V. Shakhtarin, Ya. M. Khmelevskiy, G. F. Palyga, V. Yu. Sloventantor, and A. P. Kruglikov, Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk]

UDC 616.839.008.6-092:612.273.2]-07

[Abstract] Changes that take place in the autonomic nervous system (ANS) in hypoxia are generally associated with the pO_2 levels in the inhaled gas mixture. Little heed, however, has been paid to the relationship of those changes to the initial adaptational state of the body. The work reported here studied the extent to which the blood oxygen balance is maintained in 95 individuals exposed to a gaseous hypoxic mixture, and it elucidated the nature of the interaction between peripheral and central sections of the ANS in relation to the baseline functional state of the body. In a reclining position, the individuals breathed a 10 percent oxygen hypoxic mixture for 25 minutes. Blood oxygen balance was evaluated on the basis of declines in pO_2 levels in venous blood. Also studied were pCO_2 and pH levels. Evaluation of central section activity was based on the Bayevskiy tension index (TI), whereas that of the peripheral sections was based on degree of vasoconstriction of skin vessels, which was determined with transcutaneous oxymetry (tcpO₂). Analysis of TI and tcpO₂ variations enabled the delineation of five types of body response to hypoxia in terms of heart beat rate, arterial pressure, minute volume, and acid-alkaline state. Figures 1; references 21. 16 Russian, 5 Western

Transport of (³H)-GABA Across Phenozone-K-Modified Synaptosomal Membranes

917C02884 Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 15 Oct 88)
pp 321-327

[Article by A. D. Zhdanova, S. I. Zharikov, A. Yu. Budantsev and L. I. Chernyavskaya*, Institutes of Biological Physics (Pushchino) and of *Chemical Physics (Moscow), USSR Academy of Sciences]

UDC 577.352.46:577.352.335

[Abstract] Incubation studies with synaptosomal preparations derived from the cortex and subcortical structures of 140-150 g male Wistar rats led to the demonstration that phenozone-K (potassium γ -(4-oxo-3,5-di-tert-butylphenyl)propionate) exerted a concentration-dependent effect on sodium-dependent membrane transport of radio-labeled GABA. A 5 min preincubation with low concentrations ($10E-7$ to $10E-5$ M) phenozone-K stimulated [³H]-GABA transport, at $10E-9$ and $10E-4$ M phenozone-K had no effect, and in high concentrations ($10E-3$ M) phenozone-K inhibited GABA transport across synaptosomal membranes. In the latter case, simultaneous incubation with 1 mg/ml of BSA abrogated inhibition. The fact that BSA precludes phenozone-K action was interpreted to indicate that BSA binds unsaturated fatty acids released by the action of the antioxidant, thereby altering membrane viscosity. Accordingly, the mechanism of action of phenozone-K on the synaptosomal membranes involved their structural modification rather than antioxidant action. Tables 2; references 21; 10 Russian, 11 Western

Immune Modulation of Neurochemical and Neurophysiological Processes: Catecholamine Levels, Behavior and Seizure Predisposition of White Rats Immunized With Albumin-Sydnofen Conjugate

917C0288B Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 20 Apr 89)
pp 328-334

[Article by I. P. Ashmarin, R. A. Danilova, Ye. I. Melnik, M. F. Obukhova, Sh. K. Sagimbayeva, M. L. Tsirenina, S. Yu. Ganzha and N. A. Koltovaya, Moscow state University; Institute of Applied Molecular Biology, USSR Ministry of Health, Moscow]

UDC 612.017.1:612.8.015.3:612.8-009.24

[Abstract] An investigation was conducted on the neurological sequelae resulting from generation of antibodies against the analeptic sydnofen (3-(beta-phenylisopropyl)-sydnonemino), using sydnofen-BSA conjugate, based on the assumption that such antibodies may be expected to interact with analogous endogenous factors. Studies on white rats demonstrated that immunization led eventually to depression of plasma norepinephrine and brain epinephrine levels in 32 - 47 days. In addition, brain dopamine levels showed a reduction in 12 days, reaching statistically significant depression in 32 - 47 days. Behavioral correlates revealed deterioration in maze-based food seeking along with general passivity and occasional evidence of fear. The latent period for conditioned avoidance reactions was prolonged and the threshold for corazol(60 mg/kg; s.c.)-induced convulsions was elevated. The findings were consistent with the interpretation that generation of antibodies against sydnofen resulted in interference with endogenous neurochemical mechanisms in a time-related fashion corresponding to the immune response. These findings suggest a possible 'inverse' method for immune intervention in neurological processes by generation of antibodies against exogenous and endogenous neural factors. Figures 3, references 9; 5 Russian, 4 Western

Blood Peptide Patterns in Parkinsonism Patients Before and After Therapy

917C0288C Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 13 Mar 89)
pp 336-345

[Article by O. N. Koresheonkov, A. V. Korolkov, O. A. Nikitin, M. N. Margulis and S. A. Dambinova, Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad]

UDC 612.822.1:616.858-008.6

[Abstract] A 1.5- to 2-fold increase was observed in the 300-2500 D peptide fraction of plasma in patients with

Parkinsonism after either electrostimulation or autohemotransfusion therapy, in comparison with plasma obtained before therapy and that derived from healthy donors. Studies on the effects of the 300-2500 D fractions on $[^3H]$ -glutamate binding to rat cortical receptors and postmortem human cortical tissue showed that inhibition was less pronounced with the post-treatment fractions than with the control or pretreatment fractions. In addition, the post-treatment fraction were less effective in inducing depolarization of Planorbis corneus neurons than the control fractions. Finally, the post-treatment fractions had a marked anticonvulsant effects in mice treated with haloperidol and alleviated the effects of reserpine. These observations suggest that both therapeutic modalities employed in the management of Parkinsonism enhance generation of unique 300 (0-2500) D peptides that are responsible for clinical improvement via neurochemical mechanisms. Figures 6, tables 1 references 17-13 Russian, 4 Western.

Effects of Phospholipase A₂ and Central Asian Cobra Venom on Synaptosomal Muscarinic Receptors in Rat Brain

917C0288D Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 13 Mar 89)
pp 346-351

[Article by G. N. Moskovkin, T. P. Kichikulova and B. N. Manukhin, Institute of Developmental Biology imeni N. K. Koltsov, USSR Academy of Sciences, Moscow]

UDC 612.822.1615.214.2

[Abstract] Synaptosomal preparations derived from the brains of Wistar rats were employed in assessing the effects of neat Naja naja oxiana cobra venom and its phospholipase A₂ (PI) component on muscarinic receptors. Analysis of binding plots of the muscarinic receptor blocker $[^3H]$ quinuclidinylbenzylate showed essentially parallel dose-dependent reduction in binding and K_d values with the venom and PI. Evidently, PI is the major component responsible for the action of the cobra venom on muscarinic receptors. Figures 2, tables 1, references 11-6 Russian, 4 Western.

Neurochemical Correlates of Hippocampal Involvement in Conditioned Reflexes in Rats

917C0288F Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 13 Apr 89)
pp 352-357

[Article by I. S. Chogovadze, G. D. Mikeladze, Institute of Physiology imeni I. S. Beritashvili, Georgian SSR Academy of Sciences, Tbilisi]

UDC 612.822.12

[Abstract] Conditioned avoidance reflex in 100-120 g male rats was used as a model system for studies on hippocampal neurochemical correlates of conditioned

behavior. The results demonstrated that in conditioned animals hippocampal levels of GABA, dopamine and norepinephrine dropped significantly, while serotonin rose. Neuropeptide assays revealed significant reductions in the levels of beta-endorphin and substance P and an increase in arg-vasopressin. In addition, ligand bindings studies demonstrated a marked decrease in muscarinic receptors and a sharp increase in dopamine and GABA receptors, while the concentrations of beta-adrenoreceptors remained unaltered. Finally, both cAMP-dependent and Ca^{2+} -calmodulin-dependent protein kinases showed significant elevations in activity. Accordingly, these findings demonstrated that establishment of a conditioned reflex was accompanied by activation of hippocampal dopamine-GABA-choline and peptidergic systems via interneurons projecting from the septal region. Figures 4, references 20-5 Russian, 15 Western.

Effects of Delta Sleep-Inducing Peptide on Cerebral and Hepatic Polyamine Levels in Normothermic and Hypothermic Rats

917C0288F Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 19 Mar 89)
pp 358-364

[Article by T. I. Bondarenko, A. A. Krichevskaya and Ye. A. Chernogubov, Rostov State University]

UDC 612.821.755.2.15.17:612.8.015

[Abstract] Further studies were conducted on the role of the delta sleep-inducing protein (DSIP) in stress, using outbred 150-180 g males subjected to 0-2°C for three days as the experimental model. Studies on control animals demonstrated that 12 µg/kg of DSIP given i.p. led to statistically significant elevations of putrescine, spermidine and spermine in the brain after three days, but had no telling effect on polyamine levels in the liver. However, protein levels were significantly elevated in both organs after three days. The increase in protein levels in DSIP-pretreated animals after three days at 0-2°C was far less pronounced. In addition, whereas cold exposure resulted in significant depression of cerebral levels of putrescine, spermidine and spermine, pretreatment with DSIP prevented such changes and maintained the polyamines at control levels. Furthermore, cold was shown to induce significant elevations in hepatic polyamine levels. DSIP pretreatment abrogated such elevations in the case of putrescine and spermine, but led to a significant drop in hepatic spermidine. The results were interpreted to suggest that DSIP facilitated adaptation to cold largely by equilibrating metabolic processes. Tables 3, references 22-10 Russian, 1 Czech, 11 Western.

Cardioactive Substances in Bovine Adrenal Medulla

917C0288G Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 19 Mar 89)
pp 365-370

[Article by Z. Kh. Paronyan, R. M. Srapionyan, S. S. Abramyan, L. A. Grigoryan and A. A. Galoyan, Institute of Biochemistry, Armenian SSR Academy of Sciences, Yerevan]

UDC 577.112

[Abstract] Cardioactive factors isolated from the bovine adrenal medulla were tested for the effects of various forms of physical treatment on their effects of rat brain cAMP phosphodiesterase and coronary vasodilation in cats. The results showed that six of the eight factors were completely inactivated by treatment with 6 N HCl or 1 N NaOH; factors M3₁ and M4₁ retained some activity. In addition, only factor M3₁ retained some biological activity after heat treatment at 90°C for various durations. Factors M3₁ and M4₁ displayed were resistant to inactivation by trypsin and chymotrypsin. In general, the data suggested that M3₁ is related to hypothalamic neurohormone C. In addition, the relative resistance of some factors to certain physical factors was attributed to glycosylation. Figures 3; references 8: 7 Russian, 1 Western

Effects of Microinjections of Amphetamine into Nucleus Accumbens and of Bicucullin into Substantia Nigra on Synaptic Discharge of Dopamine in Striatum

917C0288H Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 10 Apr 89)
pp 390-394

[Article by N. B. Saulskaya, A. E. Yakimovskiy and I. V. Karpova, Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad]

UDC 612.82.577.1

[Abstract] Release of dopamine into the extracellular space of the striatum in response to microinjections of amphetamine (0.5 µg) into the nucleus accumbens, bicucullin (0.2 µg) into the substantia nigra, or a combination of both, was assayed in 200-350 g male Wistar rats to assess the influence of n. accumbens on the striatum. The results demonstrated that microinjection of amphetamine into the n. accumbens reduced the dopamine level in the extracellular space of the striatum. Administration of bicucullin into the s. nigra led to elevation of dopamine levels, while injection of both agents gave results analogous to those obtained with injection of amphetamine alone. These observations demonstrated that GABA A-receptors in the medial region of the s. nigra are not involved in the mechanisms responsible for

the regulatory effects of n. accumbens on the nigro-striatal dopaminergic system. Synaptic release of dopamine in the s. nigra evidently is controlled by NA, a mechanism that appears to predominate over GABA-dependent s. nigra control mechanisms. Figures 3; references 11: 2 Russian, 9 Western

Effects of Neuroactive 4-Phenylpyridine and 4,4'-Bipyridine Derivatives on Reverse Synaptosomal Uptake of Dopamine in Mouse Brain

917C0288I Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 16 Dec 88)
pp 395-399

[Article by L. S. Solyakov, L. N. Petrova, V. V. Kalashnikov, S. Ye. Tkachenko and S. O. Bachurin, Institute of Physiologically Active Substances, USSR Academy of Sciences, Chernogolovka]

UDC 577.352.46

[Abstract] Since 1-methyl-4-phenylpyridinium (I) has been shown to induce Parkinsonian symptomatology in mice and primates, an assessment was made of the neurochemical effects of structural analogs of I as potential environmental health hazards leading to Parkinsonism. The study involved the effects of N-substituted 4-phenylpyridines (II) and 4,4'-dipyridyls (III) on reverse dopamine uptake in P₂ fractions of synaptosomal preparations derived from the brains of mice. Analysis of kinetic data demonstrated that every congener behaved as a reversible competitive inhibitor of dopamine uptake. Compound I was shown to be the most efficient inhibitor with a K_i = ca. 0.37 mM, essentially equivalent to that of dopamine itself. In the case of series II compound inhibition was inversely related to lipophilicity. Low inhibitory activity of compounds III was due to lack of protonation of the pyridyl nitrogen atom at pH 7.4. Accordingly, inhibitory efficiency was shown to be related to the degree to which the II derivatives served as cyclic analogues of biogenic amines. Figures 1, tables 1; references 13: 1 Russian, 12 Western

Effects of Bicyclic Phosphorus Esters and Picrotoxin on GABA Binding

917C0288J Yerevan NEYROKHIMIYA in Russian
Vol 8 No 3, Jul-Sep 90 (manuscript received 1 Feb 88)
pp 400-404

[Article by G. Ya. Pervukhin, A. A. Maslov, V. B. Sokolov, V. I. Fetisov and I. V. Martynov, Institute of Physiologically Active Substances, USSR Academy of Sciences, Chernogolovka, Moscow Oblast]

UDC 612.815.1.577.354

[Abstract] The fact that certain bicyclic phosphorus esters have been shown to behave as picrotoxin-like GABA antagonists and as Cl channel blockers has led to

analysis of additional congeners for similar effects. Accordingly, an analysis was conducted on the effect of 4-propyl-bicyclophosphate (PCBP) on GABA-dependent Cl permeability and interaction of binding sites for the PCBP-picrotoxin-[³H]-GABA triad, using cerebral synaptosomal preparations derived from 200-250 g male Wistar rats. The results led to the interpretation that PCBP was a more efficient Cl channel blocker than picrotoxin and, consequently, a more potent convulsant. The results implied partial overlap of PCBP and picrotoxin binding sites and direct interaction of PCBP with the ionophoric domain. The data were consistent with dual allosteric effects in the triad, suggesting that PCBP and GABA interact via several domains including the specific binding site for picrotoxin. In addition, the PCBP binding site is positioned in a manner capable of exerting a direct effect on Cl channels. Figures 2; tables 1; figures 15; 3 Russian, 12 Western.

Conditioned Feedback and Inhibitory Reorganization of Receptive Fields of Cortical Neurons as the Basis of Subconscious Alteration of Thresholds of Visual Recognition and Detection

917C02954 Moscow ZHURNAL VYSSHEY NERVOY DEYATELNOSTI IMENI I. P. PAVLOVA in Russian Vol 40 No 5, Sep-Oct 90 (manuscript received 28 Apr 90) pp 842-849

[Article by I. A. Shevelev, Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences, Moscow]

UDC 612.821.6+612.822.3+612.825.54

[Abstract] Three sets of data are described and compared: a set pertaining to significant adaptive and adaptational modification of the receptive fields of the neurons of the visual cortex of cats immobilized with d-tubocurarine; a set pertaining to conditioned-reflex, selective subsensory alteration of the threshold of an individual's perception (detection and recognition) of a letter in relation to two control letters; and a set pertaining to the role of spatially specialized cortical inhibition in the formation both of adaptive modifications of receptive fields and of the detector properties of visual cortex neurons. The receptive fields of the neurons of the primary visual cortex in the cats were found to be highly adaptive. The researchers propose a hypothesis in which the adaptiveness is explained by the local inhibitory interneuron interactions that form the receptive fields and modify them in relation to the state of the visual system and the body as a whole. They identified subsensory, counter-phase changes in the thresholds of visual detection and recognition of the image of a letter after its conditioned-reflex reinforcement via tactile or aural stimulation. Figures 5; references 18; 10 Russian, 8 Western.

Evoke-1 Activity of the Brain in Hyperbaric Conditions

917C02958 Moscow ZHURNAL VYSSHEY NERVOY DEYATELNOSTI IMENI I. P. PAVLOVA in Russian Vol 40 No 5, Sep-Oct 90 (manuscript received 16 Apr 90) pp 879-883

[Article by I. Stoilova, Institute for the Study of the Brain, Bulgarian Academy of Sciences, Sofia]

UDC 612.822.3

[Abstract] Long-term pressure-chamber tests involved 14 individuals subject to pressures of 11-46 atm. Three subjects remained at 11 atm for 8 days, three were kept at 21 atm for 15 days, six remained at 36 atm for 3-7 days, and two stayed at 46 atm for 3 days. Visually evoked potentials (VEP) produced by 0.3 J flashes (200 μsec, 1.5-3 sec apart) were recorded before the hyperbaric regime was effected, "on the ground", during decompression, and after the hyperbaric regime, with measurements taken mainly from the O₁, O₂, and C₂ regions. In the initial hyperbaric period, VEP amplitude generally declined and latent periods were extended, regardless of the magnitude of pressure. Time of onset of change varied with the individual. Although changes varied with pressure, markedness of change was not found to be proportional to pressure. Initial changes gradually returned to baseline. "On the ground," however, potentials destabilized—component amplitudes increased, latent periods were again extended. The authors conclude that the changes they noted in the amplitude-time parameters of the evoked responses indicate a restructuring of the work of the functional brain system that take part in generating responses to light stimuli. Figures 4; references 13; 3 Russian, 10 Western.

Effect of Cholinergic Substances on Mechanisms of Visual Recognition in Monkeys

917C0295C Moscow ZHURNAL VYSSHEY NERVOY DEYATELNOSTI IMENI I. P. PAVLOVA in Russian Vol 40 No 5, Sep-Oct 90 (manuscript received 12 Jul 89) pp 968-973

[Article by K. N. Dudkin, V. K. Kruchinin, I. V. Chuyeva, O. F. Noskov, V. D. Tonkopy, Institute of Physiology imeni I. P. Pavlova, USSR Academy of Sciences, Leningrad]

UDC 612.821.6+612.821.2

[Abstract] A comparative study was made of processes associated with visual recognition of black-and-white and color stimuli in six 2- to 6-year old macaque rhesus monkeys administered drugs that selectively affected the functional state of cholinergic structures of the brain, which have been shown to play a substantial role in learning, memory, and visual discrimination. The researchers found that central M-cholinergics had no effect on the functional state of

cognitive structures responsible for visual recognition, even when administered in toxic doses. Thorazine, however, did disrupt visual discrimination (black-and-white at 5 mg/kg, and color at 7 mg/kg), which was thought to be due to its cholinolytic effect, as well as to its modulating effect on

other mediator systems associated with that drug's antidepressive action. Galantamine, administered systemically in doses of 0.1-0.5 mg/kg, produced no effect, although it did restore visual discrimination lost from thorazine administration. References 18. 9 Russian, 9 Western.

Work of Belorussian Radiation Medicine Institute Described

917001174 Minsk ZDRAVOOKHRANENIYE
BELORUSSII in Russian No. 9 Sep 90 pp 25-27

[Interview with A. V. Matyukhin, director of the Radiation Medicine Scientific Research Institute about the current radiation situation in the republic. "Further Study and Comprehension Needed Following Chernobyl Nuclear Power Station Accident"]

UDC 615.2(476)

[Text] Vladimir Aleksandrovich, would you please tell us how the Radiation Medicine Institute came to be and what its tasks and plans for development are?

The Belorussian Radiation Medicine Scientific Research Institute was founded May 1, 1988, on the basis of a resolution of the directive agencies and the Belorussian SSR Council of Ministers, dated March 5, 1988. The Department of Radiation Medicine of the Central Scientific Research Laboratory of the Minsk Medical Institute, the Laboratory of Radiation Hygiene and Chromosomal Aberrations, the Clinical Section of the Oncology and Medical Radiology Belorussian Scientific Research Institute, and the Belorussian Children's Specialized Clinic became the base for the institute. In January 1989 the clinic on the base of the former "Aksakovshchina" sanatorium of the Fourth Main Directorate of the Belorussian SSR Ministry of Public Health was transferred to the institute.

The institute is directed by the leading institution in the Belorussian SSR Ministry of Health system on problems in radiation medicine. The Belorussian SSR Council of Ministers has granted permission to build a complex for the institute in the village of Novinki. But for now it is situated on four bases (Prospekt Masheroval, 23, 11 Krasnoarmeyskaya, 15, Aksakovshchina, and Borovlyany), that are up to 50 km from one another, so there are difficulties with personnel, offices, equipment, and finances.

In October 1989, a branch of the institute was opened in Gomel; in February 1990 another was opened in Mogilev; and yet another branch opening is planned in Vitebsk.

In August 1989 the Board of the Belorussian SSR Ministry of Health outlined the basic fields of scientific research work for the institute:

- to study the distribution of radionuclides in food products and how they enter the body; to assess the actual and projected amounts of radiation the people in the republic are exposed to; and to develop measures to reduce these amounts;
- to comprehensively assess and predict the health status of the people in controlled rayons of the Belorussian SSR and to develop scientific bases of

public health examinations and distribute a Register as well as to develop techniques for diagnosing and correcting detected disturbances caused by radiation.

In addition to scientific research work, the institute performs a large amount of organizational and methodical, consulting, and practical work in controlled rayons. In 1989 alone 15 expeditions of institute colleagues were organized during which more than 10,000 people were examined. Those persons needing more thorough examination and treatment were sent to the institute clinic or profile clinics and institutes. More than 15,000 people were examined in the public health polyclinic section. At the institute clinic 2,570 patients, including 1,483 children, were examined and treated.

What kind of equipment does the institute have?

For today, medical practice and science would be incomprehensible without complex modern equipment. The institute has the minimum of modern diagnostic equipment (ultrasonic and endoscopic infrared imagers), electrodiagnostic equipment (human radiation counters for measuring the internal content of radionuclides), some laboratory equipment (radioimmune laboratory, biochemical analyzer for blood and urine, and α - and γ -radiation spectrometers), and we have obtained an X-ray-fluorescent spectrometer for investigating microelements and a "Tekhnikon" blood analyzer. At the same time the institute and its branches are in acute need of ultrasound diagnostic equipment, endoscopes, a computer tomograph, mobile clinico-diagnostic and radiometric laboratories, and computers. We need reagents that are bought with hard currency.

I would like to take the opportunity to express my sincere thanks to the Belorussian Division of the Soviet Peace Fund for allocating 160,000 rubles to obtain this equipment.

What is the subject of your investigations?

The health status of the people in contaminated areas is the subject of our investigations. The biomedical sequelae of the accident at the Chernobyl Nuclear Power Station are being studied on the populational, individual, organic, cellular, molecular, and submolecular levels with the purpose of developing techniques for the early diagnosis and correction of possible disturbances.

What effects do the radionuclides that have fallen out as a result of the Chernobyl accident have on the health of people and biological aspects of living organisms?

Low doses of radiation have an effect on the victims of the Chernobyl accident. The biological effects of low doses have not been thoroughly studied. They have no specific signs, so it is difficult to determine their contribution to the general level of cancers and genetic disturbances by virtue of the low probability of manifestation of these problems. Moreover, in the contaminated territories, the effect of chemical factors released during the

accident also must be considered. The possible consequences of iodine radionuclide exposure on the thyroid gland in children are of special concern. This problem is being thoroughly studied at the institute in the endocrinology laboratory directed by Professor I. N. Astakhova. The material gathered demonstrated that an adverse tendency towards thyroid diseases arises when children are exposed to low doses of radiation and goitrogen concomitantly. Anemic syndrome in children is increasing. But this pathology is linked to a significant degree with nutritional disturbances or an unbalanced diet or one lacking in protein due to limited consumption of local produce, especially dairy products. The incidence of inflammatory diseases of the laryngeal-pharynx organs in children and hypertension and coronary disease in adults is increasing. All of the medical sequelae of the Chernobyl accident need further study and comprehension. It is still early to categorically confirm or deny anything.

What is the probability of an increase in the number of cancers from radionuclide fallout subsequent to the explosion at present and in the future?

The Belorussian Scientific Research Institute of Oncology and Medical Radiology is studying the questions of analyzing oncologic diseases in the republic. Morbidity in the republic as a whole in 1986 was 229.9 cases per 100,000 people and 247.2 cases per 100,000 in 1988. These numbers for the Gomel Oblast were 223.0 and 240.9, respectively, and 258.7 and 272.1 per 100,000 people for the Mogilev Oblast. Their growth rates are approximately identical. In some contaminated rayons the annual growth in morbidity was higher: 41 percent in Krasnopol, 40 percent in Vetkov, 31 percent in Slavgorod, while in Cherkov there was a 4 percent increase. These figures for Narovlyan and Checher were 6 percent and 1 percent, respectively. The growth rate in oncologic diseases cannot be unambiguously described in this case either.

For the inhabitants of the rayons suffering from the Chernobyl accident the elevation in the number of cases of terminal malignant tumors and leukemias, as predicted according to a "thresholdless" hypothesis, might be 0.04 percent and 0.1 percent, respectively, on a spontaneous level.

Are there any other sources of irradiation for the Belorussian people in addition to the Chernobyl Nuclear Power Station?

The Belorussian people are subjected to irradiation in the form of a natural radiation background and medical procedures. The total dose from these sources can reach (1-2) 4 REM (roentgen equivalent man) per year.

Do the consequences of atmospheric nuclear bomb explosions prior to 1963 have a direct bearing on Belorussia?

As a result of atmospheric nuclear tests prior to 1963 Belorussia was subjected to radioactive contamination as a result of which food products even prior to the

Chernobyl accident contained the synthetic radionuclides cesium and strontium.

How reliably buried are the radiation wastes, contaminated earth, and water used for radioactive decontamination of equipment, buildings, etc., during the cleanup of the accident?

In order to dispose of the radioactive wastes that accumulated during radioactive decontamination, army subunits built special repositories. Permanent repositories are currently being built in the Gomel and Mogilev Oblasts that will reliably and safely store the wastes without harming the environment.

Which radionuclides are most hazardous to the people of the republic and where are they most concentrated?

Cesium-137, cesium-134, and strontium-90 to a lesser degree, are presently the main ingredients in the formation of external and internal irradiation doses. Radionuclides in food products, mainly milk products, are the source of internal irradiation.

When will we have dosimeters and be able to freely buy them?

The production of several thousand dosimeters for measuring the dose rate is planned for 1990. It should be noted that these dosimeters are not designed for radiometric control of food products.

Is there any reason for people everywhere to fear for their safety, or do emotions contribute to this to a greater degree?

It is completely natural for people to fear for their safety. The fear of nuclear weapons hung on the people for many years. So now even small but real doses or radiation have a negative bearing on the people. In connection with this, weighted information on the part of medical workers and complete openness in questions of the medical consequences of exposure to low doses of radiation on human health is extremely important.

How do you feel about the resettlement of large numbers of people from the areas contaminated by radionuclides? Was this justified? At what degree of contamination must this be done?

The resettlement of people from the territories contaminated by the radionuclides was justified. There was the possibility of doses accumulating for life which would exceed the maximum established by the Belorussian SSR Ministry of Public Health. In making this decision, they decided that the radiation factor must not limit the people in any way with respect to their lifestyle, work, rest or eating conditions. If these conditions could not be met, then resettlement was discussed. However, it must be kept in mind that the process of resettlement and the period for adapting to a new residence are also accompanied by negative health effects.

©COPYRIGHT "Zdravookhraneniye Belorussii", 1990

Organization and Analysis of Operation of Day Hospitals

917C01274 Minsk ZDRUOKHRAZENIYE
BELLORUSII in Russian No 10, Oct 1990 (manuscript
received 18 Apr 90) pp 37-39

[Article by N. I. Stepanenko, V. I. Zayats, and Yu. G. Zemko, Health Department of Vitebsk Oblast Executive Committee, Department of Social Hygiene and Health Care Organization of Vitebsk Medical Institute; first paragraph is author abstract]

UDC 614.2.616-08-039.57

[Text] *Abstract: This article examines the organization of day hospitals at treatment-and-prevention facilities. A study was made of the structure of morbidity and the efficacy of day hospitals at urban polyclinics as related to treatment outcomes. It was shown that 95.2 percent of the patients who complete treatment are recovered or improved upon discharge. Tables 3, references 1. Key words: day hospitals, effective form of operation.*

Improving the quality of medical care rendered to the public is of critical importance at the present stage of new economic conditions. In connection with that, new, more refined forms of medical service are needed.

The day hospital is one of the progressive organizational forms of active treatment of patients who, for a number of social reasons, cannot be hospitalized in ordinary hospitals.

The purpose of this report is to study the operation of day hospitals and their efficacy at treatment-and-prevention facilities of this oblast over the past year.

The comprehensive, special-purpose oblast program Zdorovye [health] calls for the establishment of a broad network of day hospital facilities at city, rayon, and rural hospitals, at rural medical outpatient facilities, and at paramedic-obstetrics centers. A model of day hospitals was refined in Vitebsk at the Kalinin Polyclinic and at the Dokshitsy Central Rayon Polyclinic, and the experience gained in their operation has begun to be disseminated. Day hospitals are in operation in the polyclinics of 16 treatment-and-prevention facilities, with a total of 113 beds; last year, 3,588 patients were treated at those hospitals, including 374 children. There are five day-infirmaries at hospitals (1,270 patients were treated) and 12 home infirmaries in the oblast (1,021 patients were treated).

At the present time in Vitebsk, there are six day-hospitals, with a total of 69 beds. A total of 1,986 patients have been treated in those facilities since they opened. The largest day hospitals have been set up at the Kalinin polyclinic and the polyclinic No. 1 of Oktyabrskiy Rayon, and their operation is coordinated with departments of rehabilitation therapy.

It should be noted that all day hospitals operate mainly for a single shift, and their schedules are approximately the same: five days per week, from 9 am to 5 pm. However, there are differences both in forms and methods of day-hospital operation, and in structure of patient selection, equipment, and outfitting of facilities.

Such hospitals are allotted salaries for 2.5 physicians, 2.5 nurses and 2.0 nurse's aides. All of the physicians have long clinical tenure, and they are proficient in emergency care and resuscitation techniques. The hospitals are staffed and equipped without additional expenditures, as the polyclinic's personnel and equipment are used.

The therapeutic, diagnostic and rehabilitation measures used at day hospitals, as well as the indications and contraindications for admitting patients and the functions and duties of medical personnel have been developed were at the facilities.

Before being admitted to a day hospital, patients undergo a given number of tests (blood tests, chest x-rays, ECG, and others). Then the district internist sends the patient, along with the test results, to a commission headed by the deputy chief physician, or by a department head, for therapy. In turn, the commission, which is set up in every polyclinic, decides the questions of patient screening, additional tests, the possibility of the need for drug therapy or physiotherapy, therapeutic physical exercise, or transfer to a specialized hospital in the city. Specialists are consulted when necessary. A stay at the day hospital enables patients to undergo a course of treatment ahead of the population serviced by the polyclinic and without interrupting their customary social ties, thereby precluding the psychological trauma associated with admission to ordinary hospitals.

It has been established that, for the most part, those who are treated at day hospitals are individuals who have problems associated with internal medicine. They consist mainly of individuals with diseases of respiratory organs (acute bronchitis, exacerbation of chronic bronchitis, residual phenomena associated with acute pneumonia), grade I-II hypertensive disease, exacerbation of chronic gastritis, diseases of the kidneys and liver. It should be noted that, to some measure, surgical patients (with endarteritis obliterans, thrombophlebitis, varicose veins of lower extremities) make use of day hospitals, as do neurological patients (sequelae of cerebrocranial trauma, diseases of the peripheral nervous system).

We investigated the structure of morbidity and efficacy of treatment in that subunit.

Analysis of the structure of diseases for which patients were treated revealed the following. Of all patients who completed treatment, 39.3 percent had suffered from chronic, nonspecific lung disease; 25.5 percent, from vascular disease; 17.5 percent, from digestive organ disease; and 17.7 percent, from neurological and other diseases.

Investigation of morbidity in terms of individual nosological forms revealed that, among vascular diseases, endarteritis obliterans (30 percent of all patients with surgical pathology) and varicose veins of the lower extremities (20 percent) predominated. Predominant in

bronchopulmonary system pathology were acute pneumonia and chronic bronchitis (90 percent), radiculitis was predominant among the neurological cases, and chronic gastritis among cases of gastrointestinal tract disease. Other diseases included cirrhosis of the liver and chronic glomerulonephritis.

Consequently, the morbidity structure varied and, in our opinion, was largely determined by the specialty of the physician working at the day hospital.

We evaluated the efficacy of day hospitals as a function of outcome of patient treatment at each polyclinic individually and in the city as a whole.

Table 1. Structure of Patients Who Had Completed Treatment at Polyclinic Day Hospitals

Nature of illness	Percentage
Cardiologic	52.5
Pneumologic	27.6
Neurologic and gastroenterologic	18.0
Endocrinologic	1.8

Table 2. Average Duration of Treatment in 1989

Disease	At polyclinic day hospitals, in days	At oblast hospitals, in days
Cardiologic	10.8	13.0
Pneumologic	10.8	16.7
Neurologic and gastroenterologic	10.8	14.0
Endocrinologic	10.8	15.0
Other	10.8	15.0

As can be seen in Table 3, treatment resulted in considerable improvement in an average of 73.5 percent of the patients, and 20.7 percent made a complete recovery. At the same time, the condition of 4.1 percent of the patients remained unchanged. Worsening occurred in only 1.7 percent of the cases.

Table 3. Results of Treatment (in percentage of number of patients who underwent treatment) at Day Hospitals in Vitebsk

Results	Polyclinic (ment) Lenin	Polyclinic (ment) Kalinin	Polyclinic No. 1	VTZ (expansion unknown) polyclinic	Average for the city
Improved	73.5	73.5	73.5	73.5	73.5
Recovered	20.7	20.7	20.7	20.7	20.7
No change	4.1	4.1	4.1	4.1	4.1
Worsened	1.7	1.7	1.7	1.7	1.7

Further analysis of the performance of day hospitals revealed that duration of treatment per patient lasted an average of 11.5 days, reaching 15 days in a number of day hospitals.

It should be noted that that indicator is a function of diagnosis, the patient's age and efficacy of instituted treatment.

Conclusions

1. Day hospitals are an economically advantageous and effective form of rendering medical care. They make it possible to augment availability of hospital care to the public, permit more efficient use of beds, enable the improvement of health of groups of patients who are sick often and for long periods of time, the disabled and the unemployed, and make it possible to effect medical, vocational and social rehabilitation.

2. Day hospitals at treatment-and-prevention facilities represent a promising direction in the search for new ways to further improve medical care of the public.

References

1. Zagorodny, V. V., Bodaretskiy G. M., Grigorenko, V. V., et al. "Organization of Day Hospitals at Polyclinics." SOV. ZDRAVOOKHR., 1989, No. 12, pp. 41-42.

COPYRIGHT "Zdravookhraneniye Belorussii", 1990.

Trade Unions Help Chernobyl

9/7/90/394 Moscow TRUD in Russian 70 Nov. 1.

[Article picked up from TASS, first paragraph is TRUD introduction.]

[Text] More than 700,000 people affected by the accident at the Chernobyl Nuclear Electric Power Plant will undergo rehabilitation and treatment next year at trade union convalescent centers in our country.

Expansion of help for Chernobyl victims is called for by a special program that was designed to cover the period 1990-1995 and was approved on 29 November [1990] by the presidium of the Council of the Universal Confederation of Trade Unions (VKP) of the USSR. Tied to a single national program, the document is aimed at providing normal living and working conditions and medical, community, trade and cultural services to victims of the nuclear accident.

The trade-union program calls for, in particular, the construction of at least 300 health-improvement centers (with accommodations for 500 people in each) for school children and their parents in ecologically clean regions of European USSR within the next two years.

It was decided to establish an All-Union fund of trade-union solidarity to care for children living near Chernobyl and other ecologically problematic areas.

Funds for Leukemia Treatment

91'00139B Moscow KOMSOMOLSKAYA PRUDA
in Russian 14 Nov 90 p. 2

[Article by O. Chegodayeva. "We Continue to Die of Leukemia For Our Country. Treatment of the Disease Has Become a Serious Economic Problem"]

[Text] Only a few years ago, the diagnosis of acute leukemia sounded like a death sentence for our children, whereas in many foreign clinics, hematologists had achieved considerable success in the treatment of the disease. If 5-25 percent of the patients pulled through in the Soviet Union, the figure is as high as 80 percent in developed countries. Today, the situation has changed somewhat, however, patients' hopes are linked mainly to foreign medicine. Soviet medicine is able thus far to administer the necessary treatment to only 10 percent of all cases. What about the other 90 percent? Each of the 5,500 new patients who appear every year wants to avail himself of the chance to be cured. The reason that this can be done for only a few people is the high cost of the treatment. One day of treatment in our hospital costs 90-180 rubles. The course of treatment lasts two years. Our indigent health care sector does not have that kind of money. Of course, charitable funds are helpful, but still the problem of saving dying children remains largely a private, family problem.

Letters to the editor serve merely as a sad confirmation of the above. There is not enough money from charities for everyone. Treatment abroad costs \$50,000-150,000 and bone marrow transplants cost \$100,000-200,000. Thus far, two such operations have been performed successfully in the Soviet Union, but about 500 children need them. That is why parents of sick children have worn a path to funding organizations and enterprises and send desperate letters with requests to collect funds. And that even though it is obvious to every sensible person that it would be wiser to spend hard currency to train

specialists abroad and to purchase needed products than to collect such currency all over the world for each child.

Hematologists need a well-outfitted center with its own equipment and broad foreign contacts. They need financial independence. We are encouraged by the fact that the same opinion is held at the USSR Ministry of Health. For example, as of next year, the government will finance every bone marrow transplant operation, i.e., it will allocate 90,000 rubles per child. Transplant departments are being organized in Moscow, Leningrad, Kirovo, Novosibirsk, Krasnovarsk, Barnaul, Kiev, Kharkov, Gomel and Minsk. As early as late November or early December, there will be a founding congress for a new international association, "World Hematologists for Children". Its objective will be to collect funds and use them to save the lives of children. The cash will be used both for foreign treatment and for development of our own base. The founders of the association will be the Soviet Cultural Fund, Chernobyl Aid Fund, Soviet Peace Fund, Union of Lease-Holders and Entrepreneurs, Soviet Radio, the Orthodox Church, and many international charitable funds, such as World Physicians. Distribution of funds will be controlled by the Founders' Council. All of the activities of association members will be carried out, unlike many of our funds, on a charitable basis, without remuneration.

The first contributions to this noble cause have already been made, but the status of the new association has not yet been officially confirmed. We must hurry. The forecast of physicians is that starting in 1990, an increase is expected in number of leukemia cases in zones affected by radiation. Our children cannot wait. We are appealing to the Supreme Soviet of the USSR not to allow this plan to be left only as a plan. For all those who need help, as well as those who would like to support the World Hematologists for Children Association, the address is 117513, Moscow, Leninskiy Prospekt 113, Republic Pediatric Hospital, World Hematologists for Children Association, phone: 434-81-41.

END OF

FICHE

DATE FILMED

14 June 1991

